



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
-----------------	-------------	----------------------	---------------------	------------------

10/572,753

03/21/2006

Hajime Nakamura

062281

9440

38834

7590

01/25/2010

WESTERMAN, HATTORI, DANIELS & ADRIAN, LLP  
1250 CONNECTICUT AVENUE, NW  
SUITE 700  
WASHINGTON, DC 20036

EXAMINER

HOBAN, MATTHEW E

ART UNIT

PAPER NUMBER

1793

NOTIFICATION DATE

DELIVERY MODE

01/25/2010

ELECTRONIC

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

patentmail@whda.com

<b>Office Action Summary</b>	<b>Application No.</b> 10/572,753	<b>Applicant(s)</b> NAKAMURA ET AL.	
	<b>Examiner</b> Matthew E. Hoban	<b>Art Unit</b> 1793	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

#### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

- 1) ☒ Responsive to communication(s) filed on 23 October 2009.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

- 4) ☒ Claim(s) 1-6 and 10-42 is/are pending in the application.  
4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 11 and 19-32 is/are allowed.
- 6) ☒ Claim(s) 1-6, 10, 12-18 and 33-42 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
a) ☒ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

- |  |   |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftperson's Patent Drawing Review (PTO-948)                        | 5) <input type="checkbox"/> Notice of Informal Patent Application                       |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

### **DETAILED ACTION**

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 10/23/2009 has been entered.

### ***Claim Rejections - 35 USC § 112***

1. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

2. Claims 1-10, 12-18, 33-42 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. The instant claims all recite magnet sizes which were not appreciated at any point in the originally filed specification and appear to be arbitrarily construed in order to overcome the prior art. Based on this, one of ordinary skill in the art would not determine that the applicant had possession of the instantly claimed invention, as the invention as claimed is taught away from based on

Art Unit: 1793

the instant specification. Furthermore, the claim 1, which only states a minimum size of the magnet, is completely outside the scope of the instant specification, as this range extends out of the disclosed range. See MPEP 2163.05.

### ***Claim Rejections - 35 USC § 103***

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

3. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to

Art Unit: 1793

consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

4. Claims 1-6, 10, 12-18 and 33-39 are rejected under 35 U.S.C. 103(a) as being unpatentable over Fujimura in 4859255 in view of Kim in 7163591 and further in view of Beeby in his publication entitled "Micromachined silicon Generator for Harvesting Powder from Vibrations" or Gao in "Effects of the degree of grain alignment on the hard magnetic properties of sintered NdFeB magnets", independently.

**Regarding Claim 1 and 18:** Fujimura teaches permanent magnets of the (Fe,Co)-B-R family (wherein the amount of Co can be 0) (See Abstract). These magnets are made by the basic steps as set forth in column 8, lines 25-50, with an additional optional aging step which can be performed at from 350 to the sintering temperature, where in the sintering temperature is defined as anything between 900 and 1200 C (See Column 8, Lines 5-20).

Fujimura does not use a heat treatment where a powder of a fluoride of R is disposed on the sintered magnet form.

However, Kim teaches that by incorporating a heat treatment step wherein any of  $\text{DyF}_3$ ,  $\text{Dy}_2\text{O}_3$ ,  $\text{PrF}_3$  and  $\text{NdF}_3$  is disposed with the sintered magnetic composition in order to increase many of the properties of the form (see Figure 4). The specific properties improved include  $iH_c$ , M (See Paragraph 49-51), as well as increasing the

Art Unit: 1793

microstructural soundness and uniformity of the grains as well as increasing the smoothness of the surface. This leads to a lower nucleation rate of reversed domains, leading to higher coercivity (See Paragraph 53-56).

Therefore, it would have been obvious based on the teachings of Kim to include a heat treatment step including any of the disclosed additives with the sintered form, after the initial sintering of the composition. This fits well with the Fujimura reference, as this reference also uses a sintering step. Therefore, the magnetic form of Fujimura could have similar improvements in the above stated properties as taught by Kim. This would provide ample motivation to one of ordinary skill in the art to combine these references

Fujimura is silent as to the created magnets as far as their intended dimensions go.

However, NdFeB magnets of dimensions 1mm x 1mm x .75 mm are known within the art and are used for Micro Generators as can be seen in the publication of Beeby (See Section 4). Therefore, as magnets of these dimensions are needed, it would be obvious to produce a magnet with these dimensions as a matter of necessity. Thus it would be obvious for one of ordinary skill in the art to produce such magnets motivated by the need for magnets for use in Micro Generators.

Alternatively, Gao teaches that it is known to create NdFeB magnets of 8mm diameter and 10 mm length (See Experimental). Therefore, this geometry is known within the art

Art Unit: 1793

and it would be obvious to form the matter of the applied art into such a geometry based on the fact that Fujimura is not limited to any particular geometry. The motivation for this combination is based on the necessity for these magnets to be produced in various forms for various applications.

**Regarding Claims 2-3 and 16:** Fujimura teaches that magnets of the size 1mm x 1mm x .75 mm are desired within the art of creating microgenerators.

**Regarding Claims 2 and 15-17:** Gao teaches that magnets of 8mmx8mmx10mm size are known in the art and would thus be obvious to make.

**Regarding Claims 4 and 33:** The filling factor of the additive as used by Kim is at least 10% which is evidenced by the fact that the surrounding space contains no other fillers aside from the rare earth fluorides. Thus the filling factor of the additive as compared to other fillers would be greater than 10% and would be nearly 100%.

**Regarding Claim 5 and 34:** The particle size of the additive as used by Kim is between .1 and 50 microns as evidenced by line 36 of column 3.

**Regarding Claim 6 and 35:** At column 5, Lines 17-25 Kim gives several options for the R-compound useful in his invention including composition where R is Dy. A broader

Art Unit: 1793

embodiment of his invention at Lines 40-45 of Column 3 also includes Tb as a suitable R type element. Therefore if only Dy or Tb is used the atomic percent of Dy or Tb in these powders would be 100%.

**Regarding Claim 36:** As stated previously, Kim gives a method in Column 3 where R-fluoride powders are heat treated in conjunction with R-Fe-B magnets. This heat treatment would inherently create diffusion of both R and fluoride Atoms into the R-Fe-B magnet and vice versa, meaning that some amount of additive would inherently be absorbed by the magnetic particles. This phenomenon is noted by Kim at column 5, line 60 through column 6, line 5.

**Regarding Claim 37:** At Column 4, Line 57-62 Kim draws particular attention to the Nd-Fe-B magnet system. This system is characterized by the formula  $\text{Nd}_2\text{FeB}_{14}$ . Therefore, this magnet contains 11.6 at% Nd. Although other formulae are known with slightly higher conc. of rare earth.

Kim goes on to draw particular attention to the effects of Dysprosium compounds, where these compounds are used to increase and maximize  $iH_c$  of the sintered magnetic form. Dysprosium Fluoride and Dysprosium Oxide contain 100 at% Dy and contains 0 at% Nd (See Column 5, Lines 25-28). Thus a system using Nd-Fe-B as a sintered magnetic form and Dysprosium compounds as an additive meets all the limits of Claim 8.



**Regarding Claim 38:** Kim teaches using only R-compounds in the additive, which are comprised only of such fluorides. Thus the balance could be considered to be composed of nitrides, oxides, hydroxides and hydrides of R, since compounds such as oxides and hydroxides would be common impurities. Nevertheless, Kim teaches powders comprising entirely R-Fluorides so the balance of the composition outside of R-Fluorides would essentially be 0. The claim language does not necessarily state that the powder can not be entirely comprised of Fluoride and therefore does not necessitate the inclusion of nitrides, oxides, hydrides, carbides, or hydroxides.

**Regarding Claims 10 and 39:** The process of Fujimura in view of Kim would include the heat treatment of Kim between the sintering and aging of the powders. Kim teaches that the aging of NdFeB magnets occurs at a temperature between 350 and the sintering temperature, wherein the sintering temperature is between 900-1200C (See Column 8). The intermittent heat treatment to dispose  $DyF_3$  on the magnetic forms to improve their properties is from 500-1100C (See Column 2, Lines 0-10). Therefore within this combination of references, the sintering temperature can be greater than the heat treatment temperature, which in turn is greater than the aging temperature.

Art Unit: 1793

1. Claims 12, 14, 40 and 42 are rejected under 35 U.S.C. 103(a) as being unpatentable over Fujimura in 4859255 in view of Kim in 7,163,591 and further in view of Gao as applied to claim 1 above, and further in view of Mitsuji in 5286366.

2.

Please review the rejection under Fujimura in view of Kim and further in view of Beeby or Gao to understand the scope of this invention.

The applied art does not teach using an acid, alkali, or organic solvent to clean the magnet form.

Mitsuji, however, teaches that it is beneficial to add several other layers to the surface of a Nd-Fe-B type magnet due to this composition's inherently poor chemical resistance. This is improved by adding nickel and copper coatings to prevent chemical degradation (See Abstract). In order to add this layer the magnet must first have its outer surface layer removed, since this layer has been degraded by the manufacturing process. The magnet is thus etched with nitric and acetic acid to remove from 5-20 microns (See Column 5, Lines 10-35). The layers are then applied to the magnetic material. The use of this process would clean the surface of the magnetic form in order to allow the plating process to occur.

Art Unit: 1793

One of ordinary skill in the art would have found that this process of Mitsuji would be highly applicable to the magnetic material as described by Fujimura in view of Kim and further in view of Beeby or Gao.

The process of altering the surface of the article, necessitates that the article's composition can be acted upon and thus would require the removal of oxide layers which would inhibit the diffusion of the Dy or F to the magnetic core.

Therefore, the process of cleaning a magnet prior to post processing would be obvious and motivated in the view of one of ordinary skill in the art. Another cleaning step prior to the final coating process would also be obvious since the disposal of the Dy-fluoride powder requires a heat treatment step, in which the oxide skin would redevelop and would subsequently need to be removed by the same process prior to the plating operation.

3. Claims 13 and 41 and rejected under 35 U.S.C. 103(a) as being unpatentable over Kim in 7,163,591 as applied to claim 1 above, and further in view of Hamada in 6777097.

Please review the rejection under Fujimura in view of Kim and further in view of Beeby or Gao to understand the scope of this invention.

Art Unit: 1793

The applied art does not teach a shot peening step prior to disposing the powder on the sintered magnet.

Hamada, however, teaches that it is beneficial to add a composite coating to the surface of a Nd-Fe-B type magnet due to this composition's inherently poor chemical resistance. This is improved by adding a silicone resin along with flakes of fine powder to prevent chemical degradation (See Abstract). In order to add this layer the magnet must first have its outer surface layer removed, since oxidation must be removed from the surface of the magnet. The magnet can thus be put through several different processes to attain this goal, such as shot blasting or cleaning with caustic fluids (See Column 5, Lines 30-60). The layers are then applied to the magnetic material. The use of this process would clean the surface of the magnetic form of oxides in order to allow the plating process to occur. Thus under this interpretation the particles of Kim are an initial magnetic form, where the formed particles represent a final magnetic form. The term magnetic form is never explicitly defined. After dip coating the composite magnet is heat treated to decompose the silicone resin into silica (See Column 5, Lines 5-15).

The process of altering the surface of the article, necessitates that the article's composition can be acted upon and thus would require the removal of oxide layers which would inhibit the diffusion of the Dy or F to the magnetic core.

Art Unit: 1793

Therefore, the process of cleaning a magnet by shot peening prior to post processing would be obvious and motivated in the view of one of ordinary skill in the art.

### ***Double Patenting***

4. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the “right to exclude” granted by a patent and to prevent possible harassment by multiple assignees. A nonstatutory obviousness-type double patenting rejection is appropriate where the conflicting claims are not identical, but at least one examined application claim is not patentably distinct from the reference claim(s) because the examined application claim is either anticipated by, or would have been obvious over, the reference claim(s). See, e.g., *In re Berg*, 140 F.3d 1428, 46 USPQ2d 1226 (Fed. Cir. 1998); *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) or 1.321(d) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent either is shown to be commonly owned with this application, or claims an invention made as a result of activities undertaken within the scope of a joint research agreement.

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

5. Claims 1-42 are rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 1-16 of U.S. Patent No. 7559996.

Although the conflicting claims are not identical, they are not patentably distinct from each other because the claims of the patented application are to a method that is similar in all regards to the instant application. The only difference between the patented

Art Unit: 1793

claims and that of the instant application arise from the creation of slits on the magnet surface to facilitate the diffusion of the fluoride/oxide/oxyfluoride, however, these slits are immaterial as the instantly claimed subject matter would include the process of the patented claimed. Therefore, the process of the patented application substantially includes all the steps of the instant claims, and therefore obviates the claimed subject matter.

6. Claims 1-42 are provisionally rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 1-24 of copending Application No. 11/783639. Although the conflicting claims are not identical, they are not patentably distinct from each other because the copending application claims a method materially the same as that of the instant claims. The difference in the applications arises from the broader disclosure of the magnetic body, wherein this broader range includes the claimed magnetic body. Therefore, the method includes a magnetic body consisting of an overlapping range of compositions with the instant claims. Overlapping ranges have been held to represent a prima-facie case of obviousness over the prior art. See MPEP 2144.05.

This is a provisional obviousness-type double patenting rejection because the conflicting claims have not in fact been patented.

***Allowable Subject Matter***

7. Claims 11 and 19-32 are allowed.

See Reasons for Indicating Allowable Subject Matter in Prior Rejection.

***Response to Arguments***

Applicant argues against the new matter rejection on the claims, which have been expanded to include several other claims based on the newly amended claims. The applicant argues several decisions supporting the view that the originally filed specification needn't describe the subject matter *ipsis verbis* in order to satisfy the written description requirement. In the case of Wertheim, applicant cites the CCPA and specifically points to the passage where the CCPA determined that such holdings, as those seen in Werthiem, "let form triumph over substance". In terms of the instant claims, the new matter added does not add "substance" which is commensurate in scope with the originally filed application. One of ordinary skill in the art would not derive such a range, and it is unclear that such a range was even considered at the time of filing based on the substance of the specification relative to the magnet size. Furthermore, the instance of claim 1, includes a range extending beyond that of the filed spec, in that this claim only recites a minimum size. As far as the lower limit of the magnetic anisotropy direction, the example pointed to does not specify which dimension is the dimension of magnetic anisotropy, making this range new matter. The arguments

Art Unit: 1793

as to amended claims 1 are unconvincing as the art also teaches Dy<sub>2</sub>O<sub>3</sub> as an additive to produce the desired effect. See Figure 4.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Matthew E. Hoban whose telephone number is (571) 270-3585. The examiner can normally be reached on Monday - Friday from 7:30 AM to 5 PM EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jerry Lorengo can be reached on (571) 272-1233. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Matthew E Hoban/  
Examiner, Art Unit 1793

/C. Melissa Koslow/  
Primary Examiner, Art Unit 1793